

Bridges

INCREMENTAL I-GIRDER LAUNCHING METHOD FLIES HIGH ON IOWA JOB



SOARING Launching technique helps carry span over valley and obstacles.

SKIRTING A MAZE OF ENVIRONMENTAL challenges including mussels, bald eagles and artifacts, a team in Iowa is launching I-girders for a highway bridge across a river valley—a technique common in Europe but rare in the U.S.

The tenth and final section of the 1,500-ft-long, 4.6-million-lb steel double structure carrying U.S. 20 was launched last month. “One doesn’t always want to be the first person to try something, but in this case we had little choice,” says Bob Younie, district engineer for the Iowa Dept. of Transportation.

The bridge is a crucial piece of the state’s Highway 20 widening to four lanes, and environmental issues held it back for 35 years, says Mike LaViolette, resident construction engineer for designer HNTB, Kansas City.

Prebid meetings required competing contractors to visit the site a number of times, says Dan Timmons, vice president of Jensen Construction, Des Moines, which won the \$20-million contract in 2000. IDOT, HNTB and contractors met constantly, he says. “We didn’t always see eye to eye but I’m glad we went through the exercise,” he adds.

A bald eagle roosting area almost restricted work to a November-April period, and the river had to be avoided because of mussels. “Even the crystal-

clear artesian water from drilled shaft foundations couldn’t be allowed into the river,” says LaViolette. “All that water had to be pumped into tanker trucks and hauled away.” The discovery of Indian artifacts caused a realignment as well.

The contractor also had to deal with exposed soil that drained toward the bridge from both sides of the valley, Timmons notes. A gravel riprap workpad on the east side helped keep machinery out of the river.

Ashton Engineering, Davenport, Iowa, designed the launching system. The preassembled girders were launched 300 ft from one pier to the next. Piers are up to 160 ft high and supported by 8-ft-dia drilled shafts up to 100 ft deep with cap beams up to 86 ft wide. “The trick was always to have enough weight behind the support so the bridge won’t tip over as you push it,” says LaViolette. “You’re applying a force of 800 kips on the back end of the bridge, and you’ve got a snake of steel 1,500 ft long and you’re trying to keep it corralled in a straight line.”

A tapered nose section extended beyond the girders for 150 ft, to account for deflection. Launchings were postponed when winds were over 20 mph. “It was a big relief to get past that first launch,” recalls LaViolette. “There were

a lot of nervous people that day.” If a launch had ever overshoot the next pier, “there was no way to back up.”

The bridge deck will now be built over the summer for a November completion. The launching cost about \$850,000, says LaViolette, but “there was lots of discussion among all parties to realize this was the best way,” adds Younie. □

Prisons

NO EARLY OUT FOR THESE INMATES

THE STORY SOUNDED LIKE THE FIRST chapter of a Stephen King tale. A new state prison, opened in February in Warren, Maine, exemplifies modern detention design. Personnel did have one small concern, however, about the \$72-million facility: a few of the doors were swinging open at night, for no apparent reason.

Investigation by Harrisonburg, Va.-based equipment subcontractor Ridley Owens of Virginia Inc. isolated the probable cause: faulty wiring that dampened the pneumatic locking system. Workers determined that moisture was developing in the compressor tanks due to improper hook-up and faulty dryers. Two compressors in each of the prison’s three lock-down units were incorrectly wired to operate simultaneously instead of on an alternating basis. Each compressor is next to a dryer, which removes water from the system. Improper compressor operation caused some of the dryers to fail, according to Michael T. Bruner, Ridley Owens project manager.

The door and hardware contract was \$3.6 million, notes Bruner. Each door weighs between 250 and 275 lb, depending on architectural details, such as attack-resistant windows. He thinks the water may have carried dirt into the system, which contaminated a few locking pneumatic solenoids.

Rewiring solved the problem by April 5. “The issue has been resolved and all doors are now working,” says Denise V. Lord, associate commissioner of the Maine Dept. of Corrections. The problem only affected a small number of the 916 doors. “It was simply a matter of fine-tuning and adjusting” several locking systems throughout the prison, she says.

MDOC operates five prisons. The legislature recently approved a \$25-million bond issue for construction of a new minimum-security facility and renovations to another. The bond issue will be on the ballot this fall. □